QUAD 33

MODEL

SERVICE MANUAL

General
For ease of servicing the Quad 33 has been divided into the clearly defined separate blocks shown within the dotted lines in the circuit diagram.

Circuit Description
The Disc input is fed directly into the Disc Adaptor board (M12021) where it passes through one of four circuits (three are normally wired leaving one blank) depending on which edge is inserted into the socket. The signal then passes to the Pre-amplifier board (M12019) which is used for amplifying the Disc input only.
After the Pre-amplifier board, pushbutton switching selects either the output of this board or signals from Radio inputs, into the Tr200/Tr201 stages of the Tape Adaptor board (M12027), or from Tape via the pre-set replay level screws.
Signals for recording on tape are also taken from this board, via the pre-set record level screws, to pins 1 and 4 of the Tape Record socket. Pins 3 and 5 of this socket are wired in parallel with those of the Tape Replay socket for convenience when a single record/replay lead is used.
The signals from the Tape Adaptor board are then switched by the channel selection buttons (←Mon, Mon→ or Stereo) to the Amplifier boards (M12017).
Pressing the Tape button selects tape replay without interrupting recording of signals from any other input, but it will, of course, cut off those signals from the speakers other than via monitoring off the tape.
The Cancel button bypasses all the Bass, Treble and Filter control circuits.
Throughout the unit the lefthand channel components are those nearest the front panel except for the filter coils where the order is reversed.
The DC supply provided on pin 4 of the output plug, derived from diode MR503, is used only as a switching supply for special installations. Its regulation is poor and it is nominally 7–8 volts at 1 milliamp maximum, intermittent rating. The DC supply is omitted on sets after serial no. 80,000.

Summary of push-button switching

Buttons Pressed		Circuits Selected
←Mon and/or Mon→	Disc	Both channels paralleled to derive mono signal from stereo pickup and fed to left, right or both channels according to buttons pressed
Stereo	Disc Radio 2 or Tape	Each input fed separately to its own channel
←Mon and/or Mon→	Radio 1	Pin 1 of Radio 1 input fed to left, right or both channels according to buttons pressed.
Stereo	Radio 1	Pins 3 and 5 of Radio 1 input separately fed to left and right channels respectively
←Mon	Radio 2 or Tape	Pin 3 of Radio 2 or Tape inputs fed to left channel
←Mon * plus Stereo	Radio 2 or Tape	Pin 3 of Radio 2 or Tape inputs fed to both channels
Mon→	Radio 2 or Tape	Pin 5 of Radio 2 or Tape inputs fed to right channel
Mon→ * plus Stereo	Radio 2 or Tape	Pin 5 of Radio 2 or Tape inputs fed to both channels

*Note: On control units earlier than serial number 7500 combinations marked * do not apply there being no internal provision for two channel mono Radio 2 or Tape replay*

Access
Removing the cover provides access to most of the components including the removable printed boards. Further access to the bottom boards and pushbutton switches can be obtained by removing the appropriate plug-in boards, the small knobs in the recessed sub-panel (grub screws), the front panel (4 screws) and the screws holding the front frame of the pushbutton switch bank concerned, to the front chassis plate. The pushbutton knobs are a push fit and removing the outer two makes it easier to use a screwdriver on the pushbutton switch unit screws.
Pushbutton caps can come loose and it is good practice to use a small amount of 'super glue' (cyano-acrylate) when replacing them.

Pushbutton Mechanisms (See Fig. 1)
The pushbutton switches used are designed for long life and their simple mechanisms and specially plated contacts should obviate the need for any routine servicing. It is rarely necessary to dismantle them and only under exceptional circumstances should switch cleaning fluids be used: abrasives, of course, never.
Two different types of pushbutton switch are used in the Quad 33 and sets will be found which have one, or the other or both.

The difference is in the method of retaining the slide assembly. Switch type 1 has a brown composite top plate and the method of disassembly is as follows –

1. Release the complete switch unit and its attached printed circuit board from the control unit as described above.
2. Ensure the pushbutton to be removed is in the relaxed position.
3. Pull the bronze clip towards the button against the spring and turn it through 90° so that its side flanges rest on the front of the switch stator moulding and is held there by the compression spring.
4. While depressing the button slightly, gently remove the U shaped wire link exposed in 3 above. Then release the pressure on the button.
5. The inner nylon moulding may now be gently withdrawn taking care not to dislodge the moving contacts on their springs. If the switch concerned is one of an inter-dependent bank it is necessary to release the latch-bar by holding one of the other buttons of that bank fully depressed while withdrawing the switch slide.
6. Reassemble in the reverse order ensuring that the longer side flange of the bronze clip rests on the U shaped wire link and that the shorter side flange snaps into the slot between the underside of the body moulding and the metal frame of the switch.

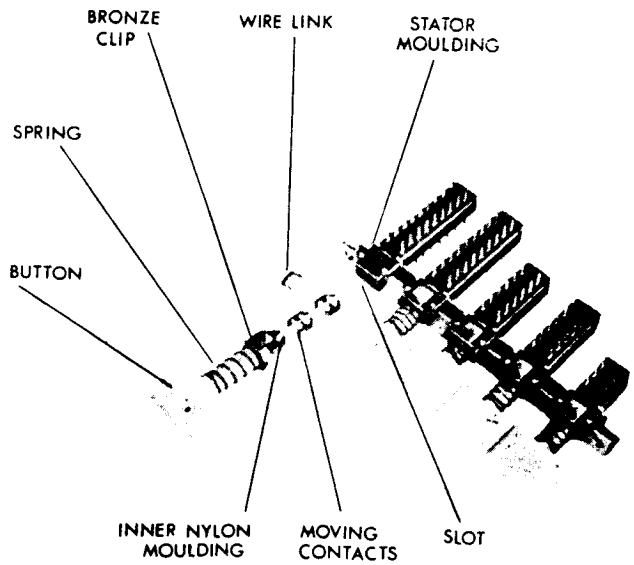


Fig. 1 Dismantling the push buttons

Switch type 2 has a grey plastic top plate and the slide retaining clip is an integral part of this moulding.
To remove the switch slide follow steps 1 and 2 as for switch type 1. Then using a very small screwdriver or spike lift the retaining tongue moulded into the grey top plate of the switch. To withdraw the switch slide, it is necessary to shift the latch bar by pressing one of the other switches belonging to that bank. Reassembly is simply the reverse procedure.

Fault Location

First carry out a superficial check of the installation, then check all the services available, ensuring that all printed circuit modules and external connectors are pushed firmly home and that the Tape button is relaxed when checking other inputs. Then from the observed symptoms, the effect of operating the controls etc., locate the fault to one unit and then to one channel or stage of that unit. If the fault appears to lie in one of the plug-in boards, change it to prove the diagnosis before changing components on it. When trying the Disc Adaptor board on another side, remember that some of the components are common to more than one position.

Satisfactory reproduction from disc proves the whole of the control unit, the power amplifier and the speakers (other than for the tape replay portion of the Tape Adaptor board) leaving only the other signal sources, viz. the radio tuner(s) and the tape recorder.

If radio and tape replay are satisfactory but not disc, try another position of the Disc Adaptor board. If this has no effect other than that expected and another pickup is not available, plug the radio tuner into the Disc input with the adaptor board in the CI position, to prove whether the fault lies in the pickup or the control unit. If the latter, the Disc pre-amplifier board (M12019) is suspect.

The tuner may also be plugged into the Tape Replay socket with the pre-set screws in the L position to prove whether the fault lies in the recorder or the control unit Tape Adaptor board, the rest of the circuit having been checked on Radio or Disc.

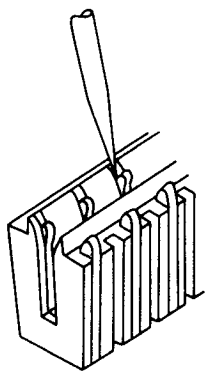
If tape replay is satisfactory but not radio or disc try another Tape Adaptor board since parts of this board used for radio and disc are not used for tape replay.

Pressing the Cancel button switches out all the Filter, Bass and Treble circuits and shows whether a fault lies in this part of the circuit or elsewhere.

To check quickly whether a no-signal condition is due to the control unit or the power amplifier, remove the interconnecting signal lead and touch the live pins (1 and 3) of the Quad amplifier input with a simple probe which should produce a fairly substantial hum from both channels equally.

Hum can be induced into the Quad 33 filter coils if the set is placed too close to a source of strong magnetic field such as the mains transformer of a power amplifier. It is readily distinguished from other possible faults since the hum is never present when the Cancel button is depressed and increases with increased filter slope and decreasing filter frequency. The cure is to move the source of magnetic field.

Edge Connector Sockets



With the type of socket illustrated, with white body mouldings, used on early units, intermittent contact between the plug-in printed circuit boards and their sockets has been known to cause confusing symptoms of erratic operation, attributed to other factors such as pushbutton switches, solder joints etc. This can be cured by closing the gap in the socket contacts by gently inserting a tapering probe of about 1/8" in diameter between each contact and the adjacent socket wall as illustrated, on both sides of the socket.

Other types of socket with black or blue body mouldings used later, provide direct replacements for the early sockets in the three upright mounting positions only. Replacing those for Disc and Tape Adaptors involves also replacing the Switch Board (M12025 issue 5) and slightly rearranging the inter-board wiring.

Volume Control

The interchannel balance of the Quad 33 is specified as better than ± 1.5dB from 0 to – 45dB attenuation. Outside this range interchannel imbalance may become noticeable, but this should not affect normal listening levels unless the input sensitivity is too great, i.e. wrong position of Disc Adaptor board or setting of Tape Adaptor board and/or the loudspeakers are unduly sensitive.

For the former cases it is merely necessary to select the correct input sensitivity setting and in the latter it is advisable to reduce the overall gain of the system by attenuating the output of the 33 control unit as shown in the accompanying sketch and table.

When replacing a volume control of Plessey or AB manufacture with one of Noble manufacture the following instructions should be observed.

1. Enlarge the fixing hole in the chassis front plate to 10mm diameter.
2. Bend the mains switch tags on the Noble potentiometer backwards to avoid too close proximity to the chassis side plate. Connection to the mains switch are shown in Fig. 2

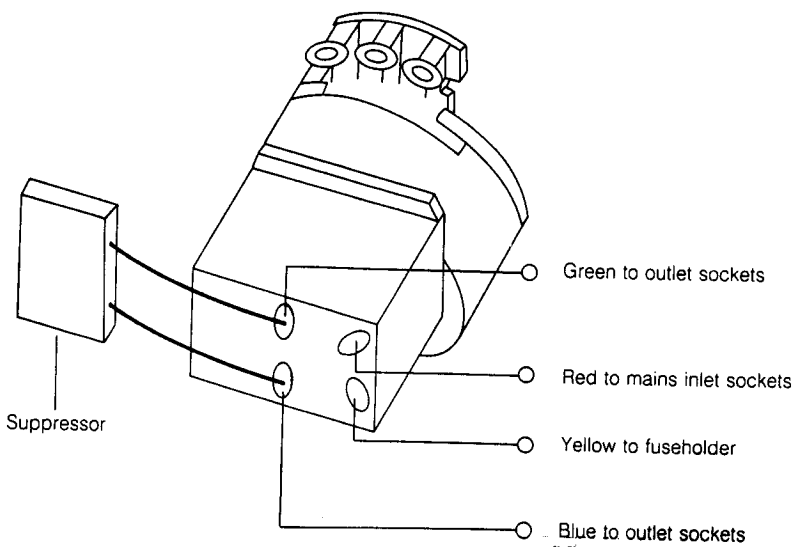


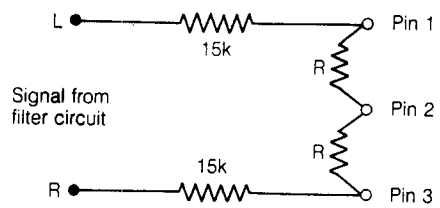
Fig. 2

3. Remove the backing paper from the piece of self-adhesive insulating material supplied and fix the latter on the chassis side plate to remove any risk of the mains connections to the switch shorting to chassis.
4. Where the mains supply has live and neutral leads, ensure that the live lead is connected to the lower switch tags.

Important
Great care should be taken to ensure that there is no possibility of the mains terminals touching the chassis.

Attenuating the Output
Fit two 15k resistors in place of the wire links on the filter board next to the output leads and two resistors of value R at the output socket between pin 2 and pins 1 and 3 respectively.
The attenuation provided by different values of R are shown in the table.

Insertion Loss dB	Resistor R kΩ
6	56.0
12	6.8
18	2.7
24	1.2



Modifications
1. before serial number 1225, the Disc and Radio inputs used the old Din system with 3-pin sockets. Pin 1 was then the lefthand channel, pin 3 the righthand channel and pin 2 earth.
2. before serial number 7500 the Radio 2 and Tape Replay inputs had no 2-channel mono switching facilities, left and righthand inputs being confined to their own channel only.
3. Serial No. 21,913. DISC PREAMP and AMP edge connectors changed.
4. C202 and C203 increased from .33μ to .68μ.
5. March 1974 (Serial No. 41,000 approx) DISC ADAPTOR and TAPE ADAPTOR edge connector changed.
6. Serial No. 71,000. Shroud added to mains outlet sockets.
7. Serial No. 80,000. DC supply omitted from pin 4 of signal output socket.

COMPONENTS LIST

Assembly No. Q33AM1A/X 33 amp board

	Part No.	Description	Qty	Circuit reference
1	C10UOZE	Capacitor 10s 63V EK	1	C 406
2	C1KOPMI	Cap 1000p 20 RT12K101NOMS	2	C 404/408
3	C2U20KM	Capacitor 2.2µ10 250V	3	C 402/403/407
4	C2U20ZE	Capacitor 2.2µ63V EK	1	C 401
5	C47UOZE	Capacitor 47µ16V EK	1	C 405
6	CU068JS	Capacity .068 5 250 B32561	1	C 400
7	DE527OX	Transistor E5270	3	TR 400/401/402
8	I12017A	PCB 33 amp M12017 ISS	1	
9	R100KJ1	Resistor 100K 5 050	1	R 407
10	R10KOJ1	Resistor 10K 5 050	1	R 410
11	R15KOJ1	Resistor 15K 5 050	3	R 400/401/409
12	R1K20J1	Resistor 1K2 5 050	1	R 413
13	R1K80G1	Resistor 1K8 2 050	1	R 411
14	R270KJ1	Resistor 270K 5 050	1	R 406
15	R270RK1	Resistor 270 10 050	1	R 404
16	R470RJ1	Resistor 407 5 050	1	R 412
17	R47KOJ1	Resistor 47K 5 050	1	R 402
18	R4K7OJ1	Resistor 4K7 5 050	2	R 405/408

Assembly No. Q33DS1A/X 33 Disc AD board

	Part No.	Description	Qty	Circuit reference
1	C1K5PKI	Cap 1500p 10 SLM50A	2	C 105/106
2	CU010JS	Cap'.01/5/160 B32561–D6103J	4	C 101/102/107/ 108
3	CU022JS	Capacitor .022u 250V D3223J	2	C 103/104
4	CU068KK	Capacitor 6800p 10 KT 1807–208	2	C 103/104
5	I12021A	PCB 33 Disc adapt M12021 ISS	1	
6	R100KJ1	Resistor 100K 5 050	2	R 113/114
7	R220RG1	Resistor 220 2 050	2	R 107/108
8	R3K30J1	Resistor 3K3 5 050	4	R 111/112/115/ 116
9	R470RJ1	Resistor 470 5 050	2	R 105/106
10	R68K0J1	Resistor 68K 5 050	4	R101/102/103 104
11	R8K20G1	Resistor 8K2 2 050	2	R 109/110

Assembly No. Q33FI1A/X 33 Filter board

	Part No.	Description	Qty	Circuit reference
1	C100UZE	Capacity 100s 6.3V EK	2	C 5/6
2	C2K2PKI	Cap 2200p 10 SLM60A	4	C 11/12/13/14
3	CU015KI	Capacitor .015s 250V SLM41A	2	C 15/16
4	CU033KI	Capacitor .033 10 SLM46A	8	C 1/2/3/4
5	I12029A	PCB 33 Filter board	1	
6	PEF044B	Edge connector F044–021–41391	2	AMPLIFIER
7	PEKEYMA	Key 4332–026–0071	2	
8	R100RJ1	Resistor 100 5 050	2	R 8/9
9	R10KOJ1	Resistor 10K 5 050	2	R 5/13
10	R1MOOJ1	Resistor 1M 5 050	2	R 7/12
11	R4K70J1	Resistor 4K7 5 050	2	R 15/16
12	R560RJ1	Resistor 560 5 050	2	R6/14
13	R5K60J1	Resistor 5K6 5 050	4	R 314/10/11
14	TB410DB	Screw 4BA 5/8 CH/HD Brass	2	
15	TB4HHPD	Nut 4BA Half brass	2	
16	L11902A	Q33 Filter coil	1	L 1/2
17	S33FILA	Switch 33 filter	2	

Assembly No. Q33PR1A/X 33 pre amp board

	Part No.	Description	Qty	Circuit reference
1	C100UZB	Capacitor 100s 16V EK	1	C 313
2	C100UZE	Capacitor 100s 6.3V EK	2	C 301/302
3	C22U0ZE	Capacitor 22s 40V EK	4	C 300/303/307/ 308
4	C2N20MI	Capacitor 2n2 CD10K202N2NZ MS	2	C 309/310
5	C47U0ZE	Capacitor 47s 16V EK	2	C 311/312
6	CU330JM	Capacitor .33 352–48334	2	C 305/306
7	DE5270X	Transistor E5270	4	TR 300/301/302/ 303
8	I12019A	PCB 33 Pre-amp M12019 ISS	1	
9	R120KJ1	Resistor 120K 5 050	2	R 303/304
10	R1K00J1	Resistor 1K 5 050	4	R 312/313/317/ 318
11	R3K30J1	Resistor 3K3 5 050	2	R 315/316
12	R47K0J1	Resistor 47K 5 050	4	R 301/302/309/ 310
13	R560RJ1	Resistor 560 5 050	3	R 300/311/314
14	R5K60J1	Resistor 5K6 5 050	2	R 306/307
15	R82K0J1	Resistor 82K 5 050	2	R 305/308

Assembly No. Q33Rest Q33 Miscellaneous

	Part No.	Description	Qty	Circuit reference
1	AFC0L12	Screw-on buffer collinson 1/2	4	
2	BB8V0LA	Lamp type 676 8V 1.2W 5mm LES	1	
3	C1N00SA	Capacitor 1n 250V RM5	1	C 17
4	M11897A	Front panel 33 C11897 ISS	1	
5	M11899A	Large knob 33 A11899 ISS	1	
6	M11900A	Small knob 33 A11900 ISS	2	
7	M11919A	Pushbutton knobs DRWG A11919	1	
8	M11930A	Q33 Sub-plate A11930 ISS 2	1	
9	M11933A	Quad insert A11933	1	
10	M11935A	Slider A 11935	1	
11	M11936A	Guide short DRWG A11936	2	
12	M11936B	Guide long DRWG A11936	2	
13	M11955A	Chassis 33 C11955 ISS	1	
14	M11991A	Cover 33/FM3 C11991 ISS	1	
15	M12000A	Connecting link A12000	1	
16	M12001A	33 Balance control knob	1	
17	M12002A	33 Disc adaptor flap	1	
18	M12003A	33 Tape adaptor flap	1	
19	M12007A	33 Plastic rear panel	1	
20	M12007B	33 Voltage indicator 200V	1	
21	M12007D	Serial No Plate Q33 a†/12007	1	
22	M12031A	Rearplate 33 B12031 ISS	1	
23	M12057A	Sub-chassis 33 Large C12057–1	1	
24	M12057B	Sub-chassis 33 Small C12057–2	1	
25	M12058A	Mains transf cover 33 A12058	1	
26	NPMR20A	Suppressor PMR 209M–547–100	1	
27	PO4DNPA	Plug 4 pin DIN Black	2	
28	PO5DNPA	Plug 5 pin DIN Black	2	
29	P340SEA	Socket 3 pin P340/SE	1	
30	P3LSS02	Lampholder LSS102	1	
31	PP587AA	Socket P587	1	
32	QU2001M	Lead US 2 pin + Moulded lead 1M	1	
33	R33BALA	Potentiometer type 43 1K	1	RV 5
34	R33BASA	Potentiometer 2 X 47K LIN	1	RV 4/7
35	R33SLOA	Potentiometer 2 × 25K LOG	1	RV 8/9
36	R33TREA	Potentiometer 2× 10K LIN	1	RV 3/6
37	R33VOLA	Potentiometer 2× 50K	1	RV 1/2
38	UM2A5DA	Fuse 20mm 2A5 Delay 5718	1	

Assembly No. Q33SU1A/X 33 Power supply

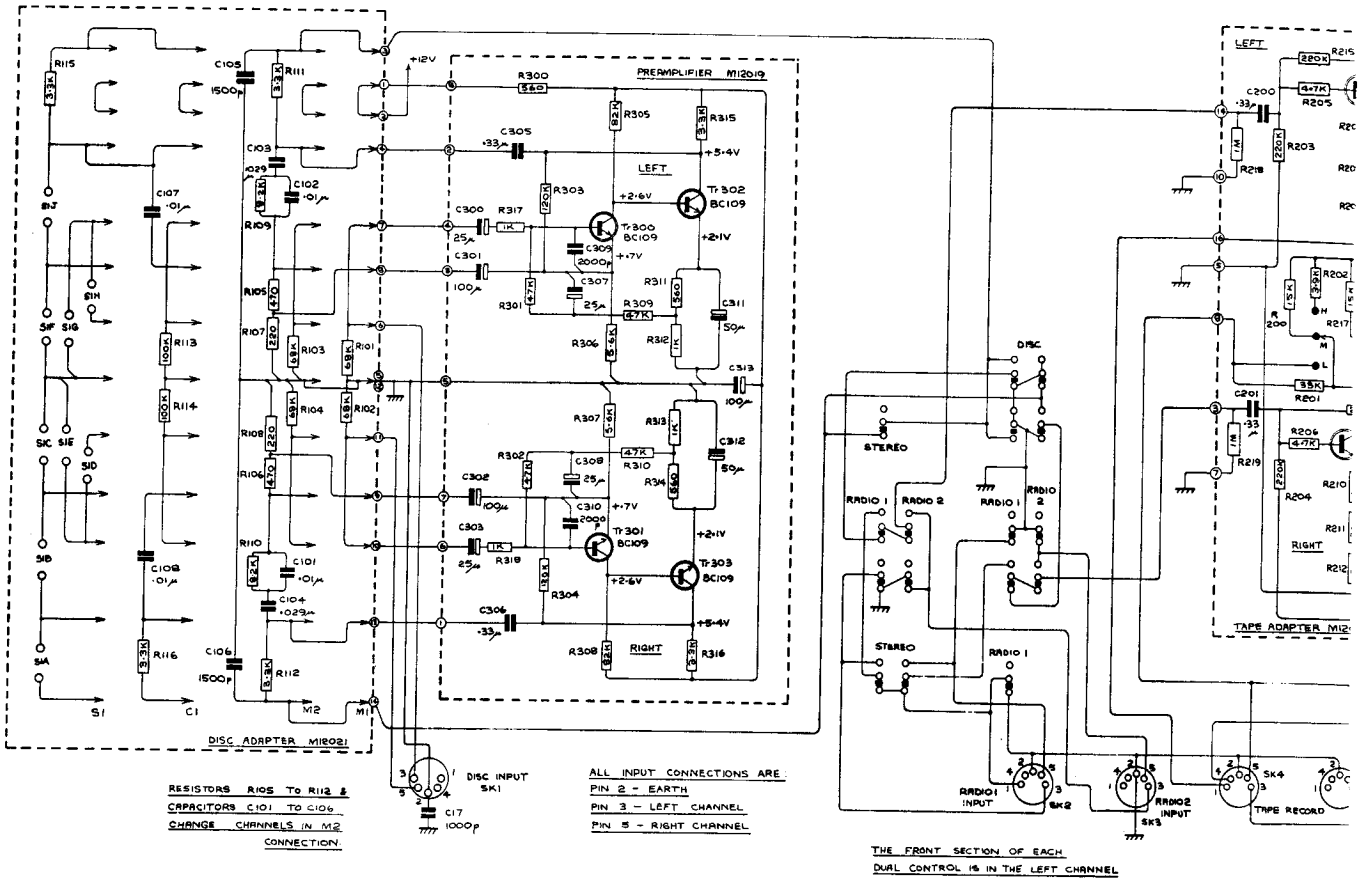
	Part No.	Description	Qty	Circuit reference
1	C1KOUTA	Capacitor 1000u 25V −10 + 50	2	C 500/501
2	C400UTM	Capacitor 400u 25V	1	C 502
3	DIS920B	Diode IS920TB	2	MR 501/502/503
4	DZ12VAA	Zener diode LR120C	1	MR 500
5	I12032A	PCB 33 Power sup M12032 ISS	1	
6	R120RK1	Resistor 120 10 050	2	R 500/501
7	L12033A	Mains Transformer	1	

Assembly No. Q33SW1A 33 Switch board

	Part No.	Description	Qty	Circuit reference
1	I12023A	PCB 33 Link M12023 ISS	1	
2	I12025A	PCB 33 switch M12025 ISS	1	
3	PEFO44A	Edge connector FO44–021–41791	1	PRE-AMP
4	PEKEYMA	Key 4332–026–0071	1	
5	PEML18A	Edge connector ML18 50612B	1	TAPE
6	PEML23A	Edge connector ML23 50613B	1	DISC
7	SEKEYPA	Key SK 789C	2	
8	S33INPA	Input selector switch	1	

Assembly No. Q33TA1A/X 33 Tape board

	Part No.	Description	Qty	Circuit reference
1	C680NKS	Capacitor .68u 100V D1684K	2	C 202/203
2	C330NJM	Capacitor .33 352–48334	2	C200/201
3	DE5270X	Transistor E5270	2	TR 200/201
4	I12027A	PCB 33 Tape adaptor	1	
5	R15K0J1	Resistor 15K 5 050	2	R 200/217
6	R180RJ1	Resistor 180 5 050	2	R 209/212
7	R1M00J1	Resistor 1M 5 050	4	R 218/219/220/ 221
8	R220KJ1	Resistor 220K 5 050	4	R 203/204/215/ 216
9	R33KoJ1	Resistor 33K 5 050	2	R 201/213
10	R3K90J1	Resistor 3K9 5 050	4	r 202/207/210
11	R4K70J1	Resistor 4K7 5 050	2	R 205/206
12	R820RJ1	Resistor 820 5 050	2	R208/211

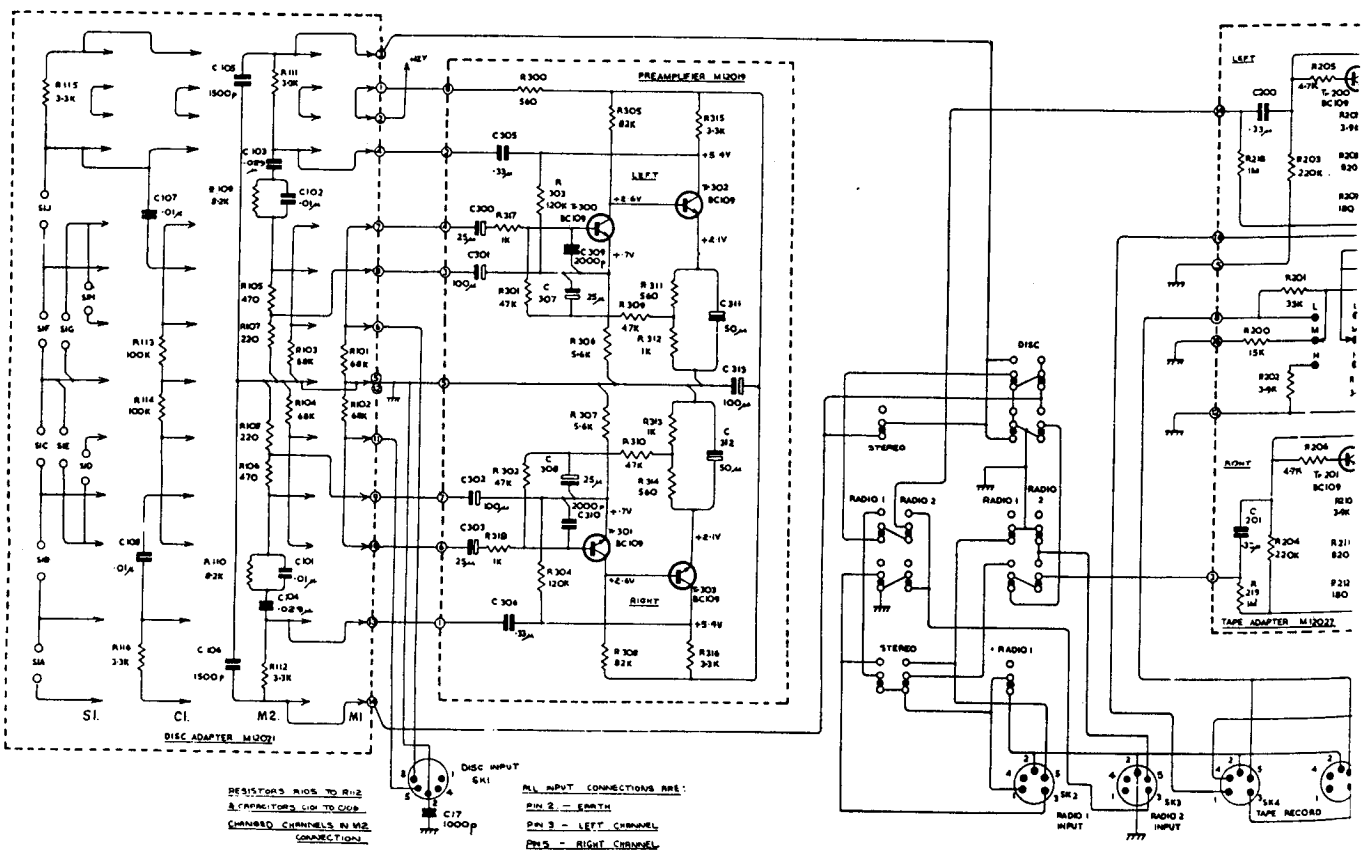


RESISTORS R105 TO R112 & CAPACITORS C101 TO C106 CHANGE CHANNELS IN M2 CONNECTION.

ALL INPUT CONNECTIONS ARE
PIN 2 – EARTH
PIN 3 – LEFT CHANNEL
PIN 5 – RIGHT CHANNEL

THE FRONT SECTION OF EACH DUAL CONTROL IS IN THE LEFT CHANNEL

CIRCUIT CHANGES MAY BE MADE FROM TIME TO TIME WITHOUT NOTICE



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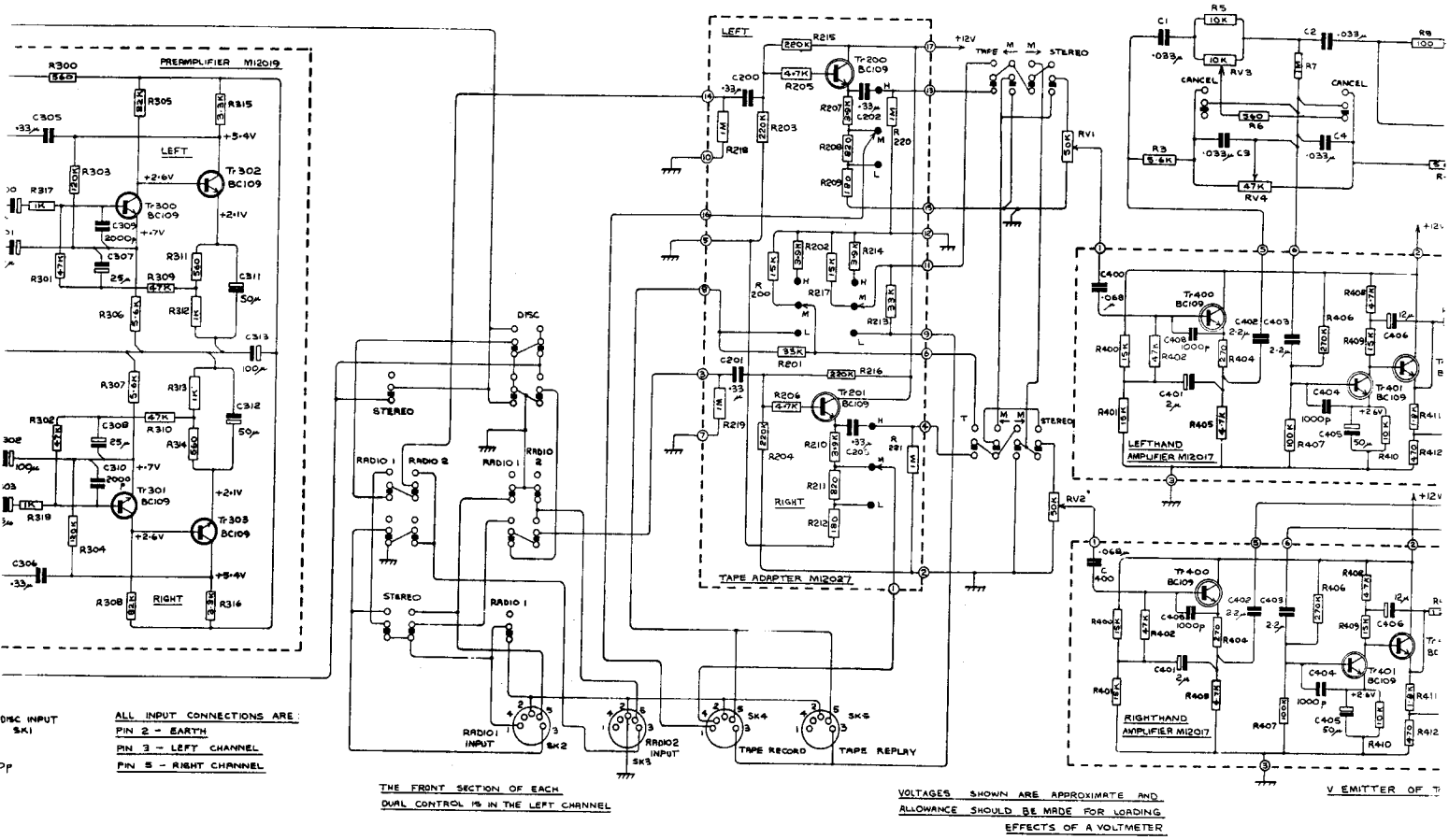
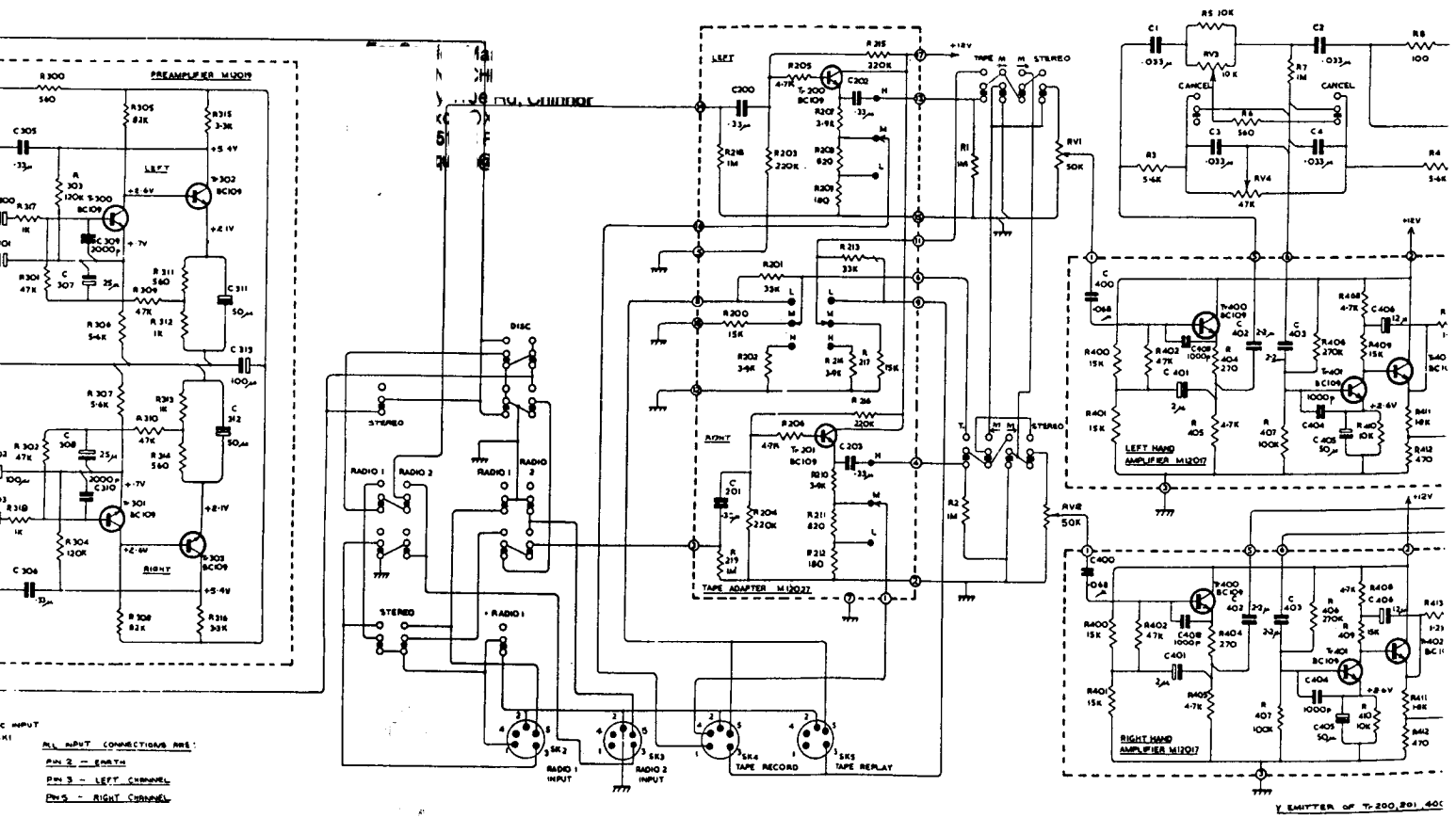
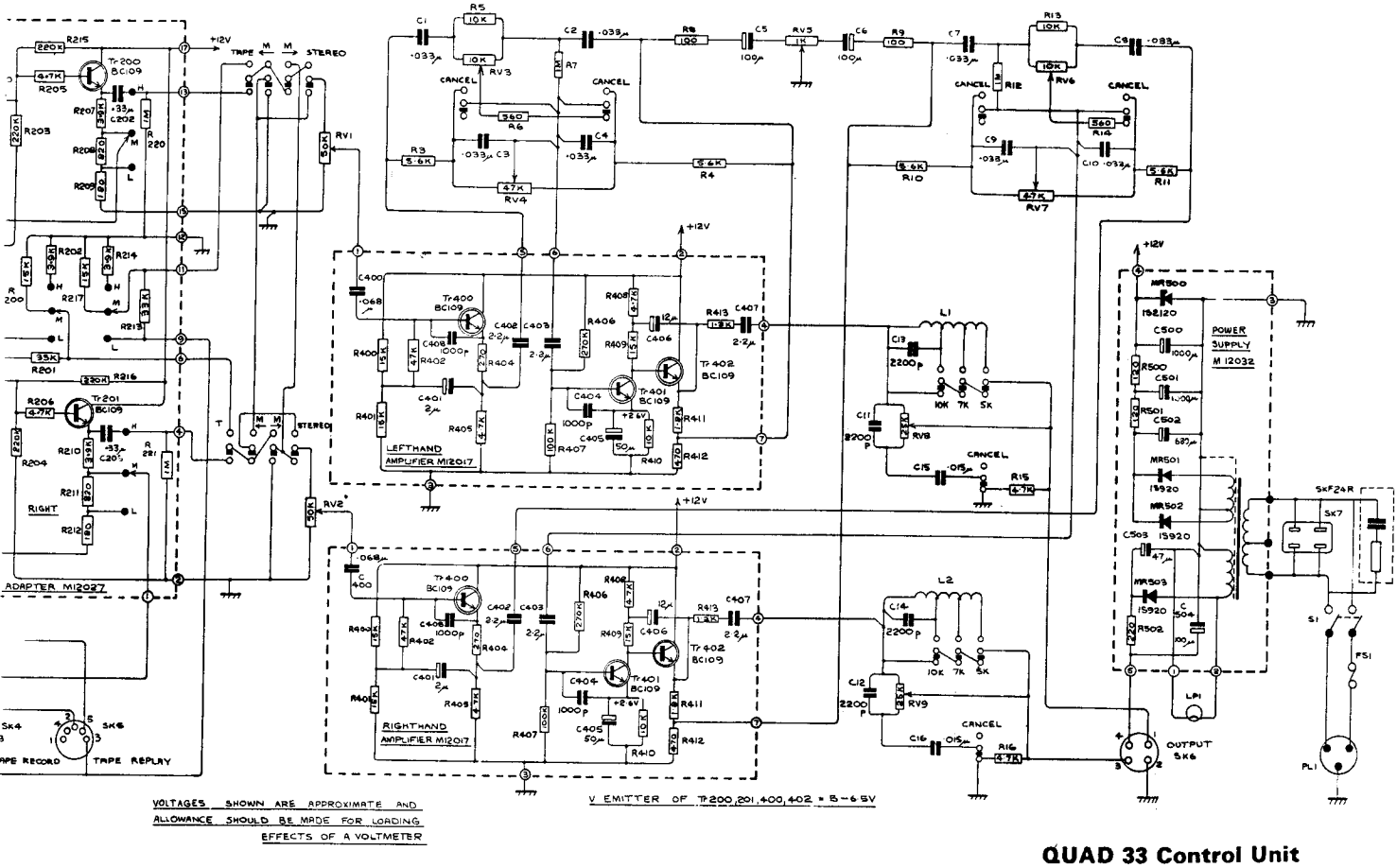
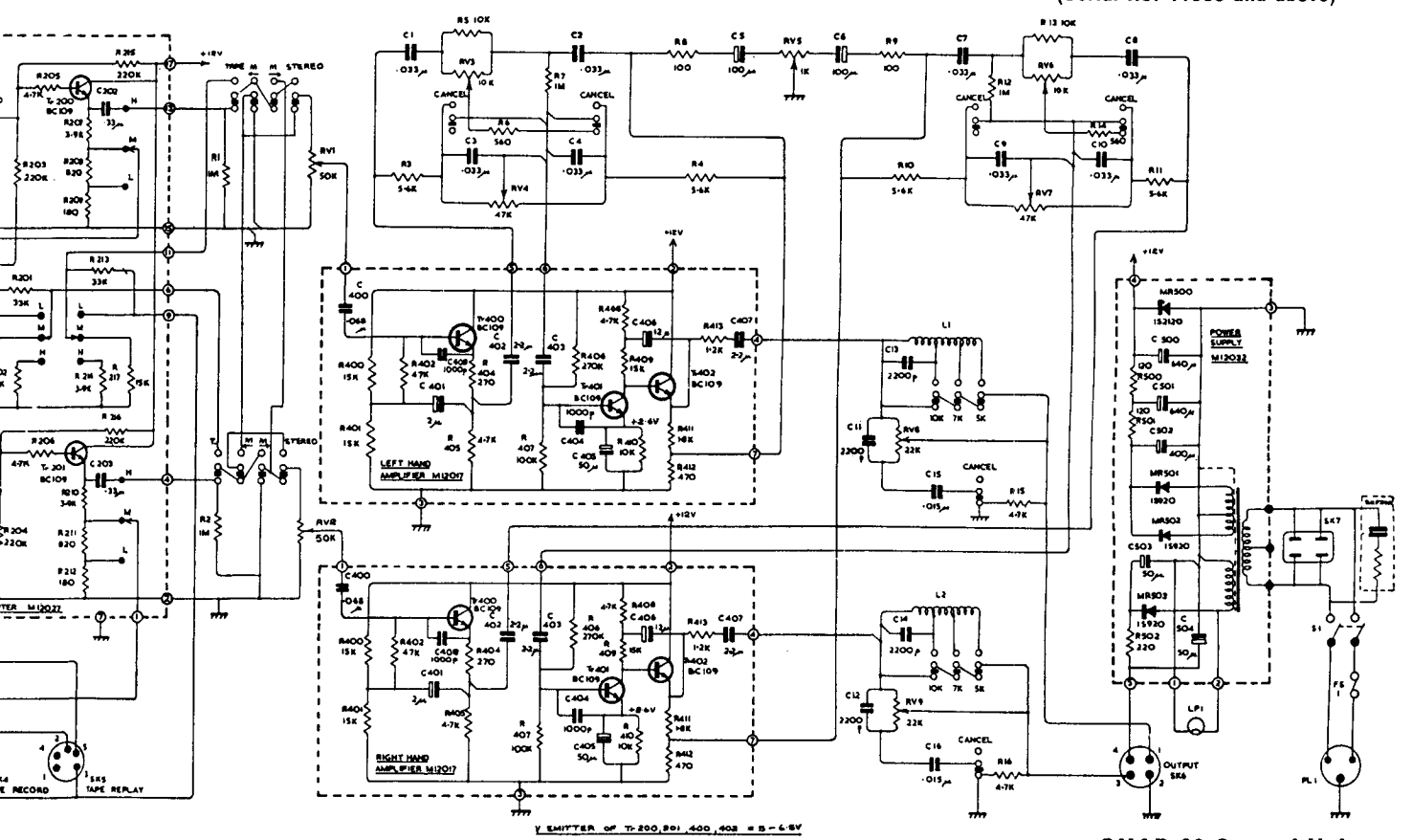


CIRCUIT CHANGES MAY BE MADE FROM TIME TO TIME WITHOUT NOTICE


PREAMPLIFIER M12019
LEFT
RIGHT
TAPE ADAPTER M12027
LEFT HAND AMPLIFIER M12017
RIGHT HAND AMPLIFIER M12017
STEREO
RADIO 1
RADIO 2
DISC
RADIO 1 INPUT
RADIO 2 INPUT
TAPE RECORD
TAPE REPLAY
ALL INPUT CONNECTIONS ARE:
PIN 2 - EARTH
PIN 3 - LEFT CHANNEL
PIN 5 - RIGHT CHANNEL
THE FRONT SECTION OF EACH DUAL CONTROL IS IN THE LEFT CHANNEL
VOLTAGES SHOWN ARE APPROXIMATE AND ALLOWANCE SHOULD BE MADE FOR LOADING EFFECTS OF A VOLTMETER
V EMITTER OF TR 200, 201, 400


LEFTHAND AMPLIFIER M12017
RIGHTHAND AMPLIFIER M12017
POWER SUPPLY M12032
ADAPTER M12027
TAPE RECORD
TAPE REPLAY
OUTPUT SK6
VOLTAGES SHOWN ARE APPROXIMATE AND ALLOWANCE SHOULD BE MADE FOR LOADING EFFECTS OF A VOLTMETER
V EMITTER OF TR200,201,400,402 = 5-6.5V

QUAD 33 Control Unit
(Serial No. 11500 and above)


LEFT HAND AMPLIFIER M12017
RIGHT HAND AMPLIFIER M12017
POWER SUPPLY M12032
TAPE RECORD
TAPE REPLAY
OUTPUT SK6
VOLTAGES SHOWN ARE APPROXIMATE AND ALLOWANCE SHOULD BE MADE FOR LOADING EFFECTS OF A VOLTMETER
V EMITTER OF TR200,201,400,402 = 5-6.5V

QUAD 33 Control Unit
(Up to Serial No. 11500)